



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,156	07/09/2003	Yian-Liang Kuo	N1085-00127 [TSMC2002-098]	9752
8933	7590	04/05/2005	EXAMINER	
DUANE MORRIS, LLP			AHMED, SHAMIM	
IP DEPARTMENT			ART UNIT	
ONE LIBERTY PLACE			PAPER NUMBER	
PHILADELPHIA, PA 19103-7396			1765	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/616,156	KUO, YIAN-LIANG	
	<b>Examiner</b>	<b>Art Unit</b>	
	Shamim Ahmed	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 17-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-16, drawn to a process, classified in class 216, subclass 13.
  - II. Claims 17-32, drawn to product, classified in class 174, subclass 250+.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by different process such as removing of solder mask using chemical etching instead of UV laser.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Steven E. Koffs on 3/30/05 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-16. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-32 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Information Disclosure Statement***

5. Part of the information disclosure statement filed 7/9/03 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the non-patent literature documents cited as marked C to F, do not provide the publication dates, wherein the website search date is not considered to be publication date of a document.

Accordingly, the examiner crosses them out and the information referred to the documents has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1,7 are rejected under 35 U.S.C. 102(b) as being anticipated by Paulus (5,626,774).

Paulus discloses a process for removing solder mask (26) from a printed circuit board to expose circuit traces (32a) using ultraviolet (UV) laser, wherein the solder

Art Unit: 1765

mask comprises epoxy resin or thermosetting resins (col.2, lines 46-50 and col.3, lines 29-32 and figure 3B).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukada et al ((US 2001/0002728 A1) in view of Gross et al (6,756,563).

Tsukada et al disclose a process of making printed circuit board including the steps of forming insulative protecting film or solder resist (4) over circuit traces or conductive pattern (3) of the printed circuit board (1) (paragraph 0029 at page 2).

Tsukada et al also teach that a laser is irradiated to remove solder resist (paragraph 0033).

Tsukada et al further teach that the printed circuit board is finally electrically tested obviously for finding defect (paragraph 0036).

Tsukada et al's laser irradiation broadly reads on any type of laser including UV laser but fail to explicitly teach that the laser comprises ultraviolet (UV) laser.

However, Gross et al teach that typically UV laser light having wavelength in the range of about 285nm- 333nm is used for efficiently removing or ablating dielectric material including glass fibers (epoxy glass), wherein the UV laser may include in solid

Art Unit: 1765

state laser such as yttrium aluminum garnet (YAG) (col.1, lines 54-61 and col.3, lines 12-37).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Gross et al's teaching into Tsukada et al's process for efficiently removing epoxy resinous substrate (solder resist) as taught by Gross et al.

10. Claims 6-8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukada et al ((US 2001/0002728 A1) in view of Gross et al (6,756,563) as applied to claims 1-5 and 9-13 above, and further in view of Paulus (5,626,774).

Modified Tsukada et al discuss in the paragraph 9 above but fail to teach the solder resist comprises organic compound such as thermosetting resin material.

However, Paulus discloses a process of making printed circuit board, wherein solder mask (26) is formed on the circuit traces, which solder mask comprises epoxy resin or thermosetting resins, in which epoxy resins provide desired physical and electrical properties (col.2, lines 39-50).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to modify the insulative film of the Tsukada et al with the teaching of Paulus to use organic compound of thermosetting resin material (epoxy resin) as the solder resist because epoxy resin will provide resins provide desired physical and electrical properties as taught by Paulus.

By doing so, one could provide better protection of the underlying circuit because epoxy resin will provide improved physical and electrical properties as taught by Paulus.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fillion et al (US 2003/0057515 A1) teach solder mask 36 can be removed by laser ablation (paragraph 0047); Berg (6,004,734) discloses the use of UV laser light in the manufacturing of PCB.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed  
Primary Examiner  
Art Unit 1765

SA  
March 30, 2005